Name:

2nd Semester Final Exam Review Packet – 2013-14

This packet has been created to help you review for the first semester exam. Go through this packet filling in information and answering questions to help prepare you for the exam. Be sure to go back, look over and study **ALL** past quizzes (quick checks, performance checks) and tests.

Terms, definitions and concepts you should know and understand.

Mass

Volume

Density

Physical Property

Metal (properties/position on PT)

Nonmetal (properties/position on PT)

Metalloid (properties/position on PT)

Elasticity

Malleability

Conductivity

Brittle

Ductility

Magnetic

Heat (Thermal Energy)

Temperature

Phase change

Solid

Liquid

Gas

Condensation

Evaporation

Sublimation

Deposition

Melting

Boiling

Freezing

Physical change

Chemical property

Periodic Table

Period/Row

Group/Family

Mixture

Element

Atom

Proton

Neutron

Electron

Compound

Molecule

Homogeneous mixture

Heterogeneous mixture

Chemical change

Atomic number

Atomic (average) Mass

Mass number

Electron energy levels/orbits/shells

Valence electrons

Ionization energy

Ion

Net Charge/Ionic Charge

Cation

Anion

Ionic bond

Covalent bond

Isotope

Subscript

Coefficient

Reactants

Products

Law of Conservation of Mass

Exothermic

Endothermic

pH

Acid

Base

Neutral

Electromagnetic/Electrostatic

Fusion

Fission

Red-shift

Blue-shift

Extra practice for terms can be found at:
http://quizlet.com/1583411/physcal-science-1st-sem-exam-review-flash-cards/

http://www.sporcle.com/games/DCHSscience/physsci1

1. How did each of the following contribute to the modern theory of the atom? If they used technology, how did it help their understanding of the atom?

Democritus

John Dalton

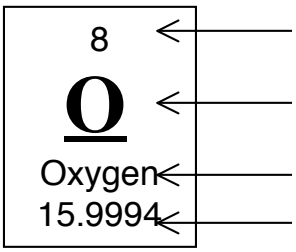
JJ Thomson

Ernest Rutherford

Niels Bohr

James Chadwick

2. Using scientific terms, what do each of these arrows represent?



3. **Period vs Group (Family):**

Periods go from _____ to _____ across the Periodic Table (horizontally)

Groups/Families go _____ and _____ vertically on the Periodic Table.

There are _____ periods and _____groups on the Periodic Table of Elements.

Periods determine the number of _____ levels (shells/orbits)

Groups determine the number of _____ electrons and _____ properties.

Practice: a) What element is in period 3 group 17? _____

b) Circle the two elements with similar chemical properties

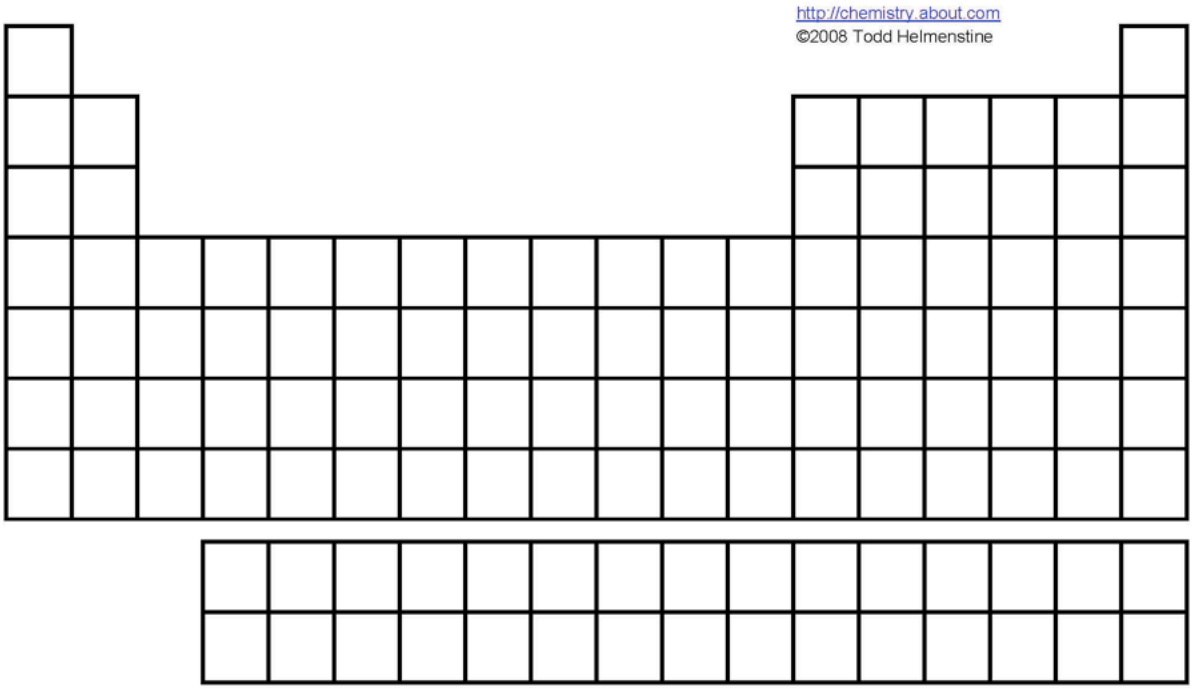
K C Mg Ca B

c) Radon has _____ energy levels and _____ valence electrons.

4. Explain or draw the trends or patterns found on the periodic table for the following:

Atomic Radius
Atomic Number
Atomic Mass
Reactivity
Ionization Energy
Valence Electrons
Metal/Non-metals/Metalloids/State at room temperature

Blank Periodic Table of the Elements



5. You should know the mass, charge and location for the following subatomic particles:

Subatomic Particle	Location	Charge	Mass	Role/Importance
Protons				
Neutrons				
Electrons				

6. Atomic mass is the number of _____ added to the number of _____

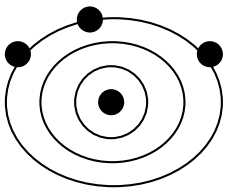
Practice: a) How many Ps and Ns does Sulfur have? P(____) + N (___) = mass # (_____)
an element has 8 protons, 7 neutrons and 8 electrons its mass # is _____amu

7. Determine how many protons, neutrons and electrons are in a neutral atom.

Element	Symbol	Atomic #	Mass #	# of Protons	# of Neutrons	# of Electrons
Carbon		6			6	
Silicon			28	14		
	Fe	26	56			

8. Take ONE element (from the chart in question #14) and draw it below placing the correct number of protons, neutrons and electrons (in their proper energy levels) in their correct positions in the atom.
(Hint: Bohr Model)

9. Valence Electrons: Fill in the first two energy levels with the correct number of electrons then fill in the blanks below.



Total # of electrons	Element symbol	# of valence electrons	Metal/Non Metalloid or Family name	Group #	Period #
_____	_____	_____	_____	_____	_____

If the element above lost one electron it becomes a positive _____.

10. Ions:

In a neutral atom, the number of protons _____ the number of electrons.

If you have more electrons (atom gained electrons) it is called a _____ ion
If you have more protons (atom has lost electrons) it is called a _____ion.

Practice: a) What family on the Periodic Table is most likely to become +3 ion _____
b) What family on the Periodic Table is most likely to become –2 ion _____
c) Draw a Bohr model of a neutral Oxygen atom then make it a negative ion.

Neutral Oxygen Negative Oxygen Ion

11. Bonding:

What subatomic particle determines how atoms bond (interact)? _____

Ionic bond is when electrons are _____
Ionic bonds form between metals and _____.

Covalent bonds are when electrons are _____.
Covalent bonds form between nonmetals and _____

The number of valence electrons all atoms want to reach to be stable is _____.

12. Writing a chemical formula for a compound:

Practice;
a) Determine the chemical formula if Mg and F bonded.
First determine the number of valence electrons to determine if it is in excess or deficient of electrons.

Mg has _____ valence electrons so it wants to get/give (circle) _____ electron

F has _____valence electrons so it wants to get/give (circle) _____electron

Is this an ionic or covalent bond? _____The correct formula is _____

b) Determine the chemical formula for H and Cl
Remember H needs 2 electrons to fill its single energy level.

Is this an ionic or covalent bond? _____The correct formula is _____

13. Use the elements Boron and Oxygen to complete the next few questions:

How many valence electrons does each have? B = _____ O = _____

How would you write the correct formula if they bonded? _____
Is this an ionic or covalent bond? _____

14. Draw the Lewis Dot diagram for the elements below. Show how they can combine to form a stable compound.

Ca + Cl =

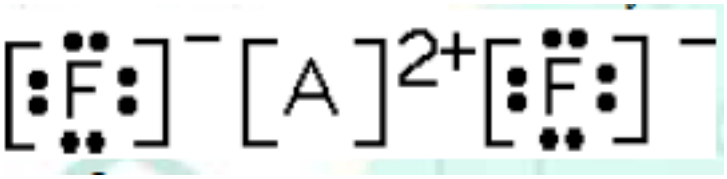
Is this an ionic or covalent bond? _____

C + H =

Is this an ionic or covalent bond? _____

Circle the shared pairs of electrons.

15.



In the molecule above, identify which elements could possible be inserted for letter A?

16. In the following compounds, identify the number of atoms for each element.

a. $4H_2SO_4$ b. $2C_6H_{12}O_6$ c. $3Ca_3(PO_4)_2$

17. Chemical Equations:

Substance to the left of the arrow are called _____
Substance to the right of the arrow are called _____
Whatever elements are on the left must be on the _____.
The total mass of reactants must be _____ to the mass of the products = **Law of Conservation of Mass.**

18. Balance the following equations:

A) ___ $NaNO_3$ + ___ PbO → ___ $Pb(NO_3)_2$ + ___ Na_2O

B) ___ AgI + ___ $Fe_2(CO_3)_3$ → ___ FeI_3 + ___ Ag_2CO_3

C) ___ $C_2H_4O_2$ + ___ O_2 → ___ CO_2 + ___ H_2O

D) ___ $ZnSO_4$ + ___ Li_2CO_3 → ___ $ZnCO_3$ + ___ Li_2SO_4

E) ___ V_2O_5 + ___ CaS → ___ CaO + ___ V_2S_5

F) ___ $Mn(NO_2)_2$ + ___ $BeCl_2$ → ___ $Be(NO_2)_2$ + ___ $MnCl_2$

19. Isotopes:

Part 1:
An isotope is an element with a different number of _____which changes its _____.

Practice: Look up Xenon's atomic mass _____

What would be the amount of neutrons in each isotope if there were only two isotopes?
_____ or _____
Which isotope above would occur in the greater amount (circle the correct answer)

Part 2:

Atom #1:	10P	10N	10E
Atom #2:	11P	11N	11E
Atom #3:	10P	11N	12E

Which atom is a different element from the others? _____

Which two atoms are isotopes of each other? #_____ and #_____

Which atom is a negative ion to atom #1? # _____

20. Thermal Energy and Temperature

Temperature is the average _____ energy of the substance.

Temperature is measured using a _____

Thermal (heat) energy is a measure of _____ energy in the substance.

As temperature increases so does the average _____.

If particles begin to slow down, the temperatures _____

Practice:

a) If you have a 50ml beaker filled with 100º C water and a 100ml beaker filled with 100ºC water, which one has the great amount of thermal energy? _____

b) Which has the greatest average kinetic energy? _____

c) If you have a 50ml beaker of 100º C water and the particles slow down, what will happen to the temperature?_____ Thermal energy? _____

d) If an ice cube is melting, what happens to the temperature? _____

e) Explain why your basketball left outside in the winter needs to be pumped up again.

21. Draw a picture that represents the molecular motion of a solid, liquid and a gas.

22. Density:

The formula for density is _____. Density is labeled_____

Practice:

a) If an object has a volume of 5.5 cm^3 and a mass of 3.0 g, what is its density? Show work below.

b) If you have 3 unknown liquids that have 3 different densities, (A=1.0g/ml, B=1.3g/ml and C = .88g/ml) draw a picture below of how they would settle out in a test tube?

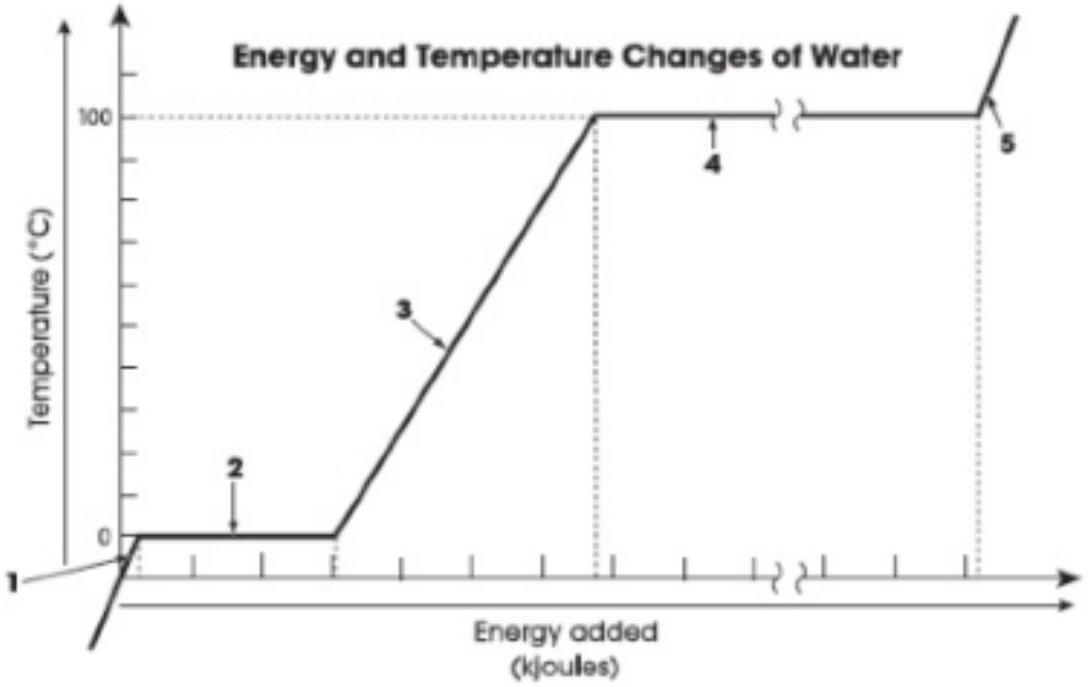
23. a. If something has a pH of 2, it would be considered a(n) _____.

b. If something has a pH of 10, it would be considered a(n) _____.

c. If something has a pH of 7, it would be considered a(n) _____.

24. Look at the graph below that represents data collected when a beaker of ice is heated on a hot plate. Use the graph to complete the questions below.

The following graph shows the change in temperature of a sample of H_2O, which begins as ice, as thermal energy is added.



a) Mark on the graph with the letter "A" where water is boiling.

b) Mark on the graph with the letter "B" where the water is melting.

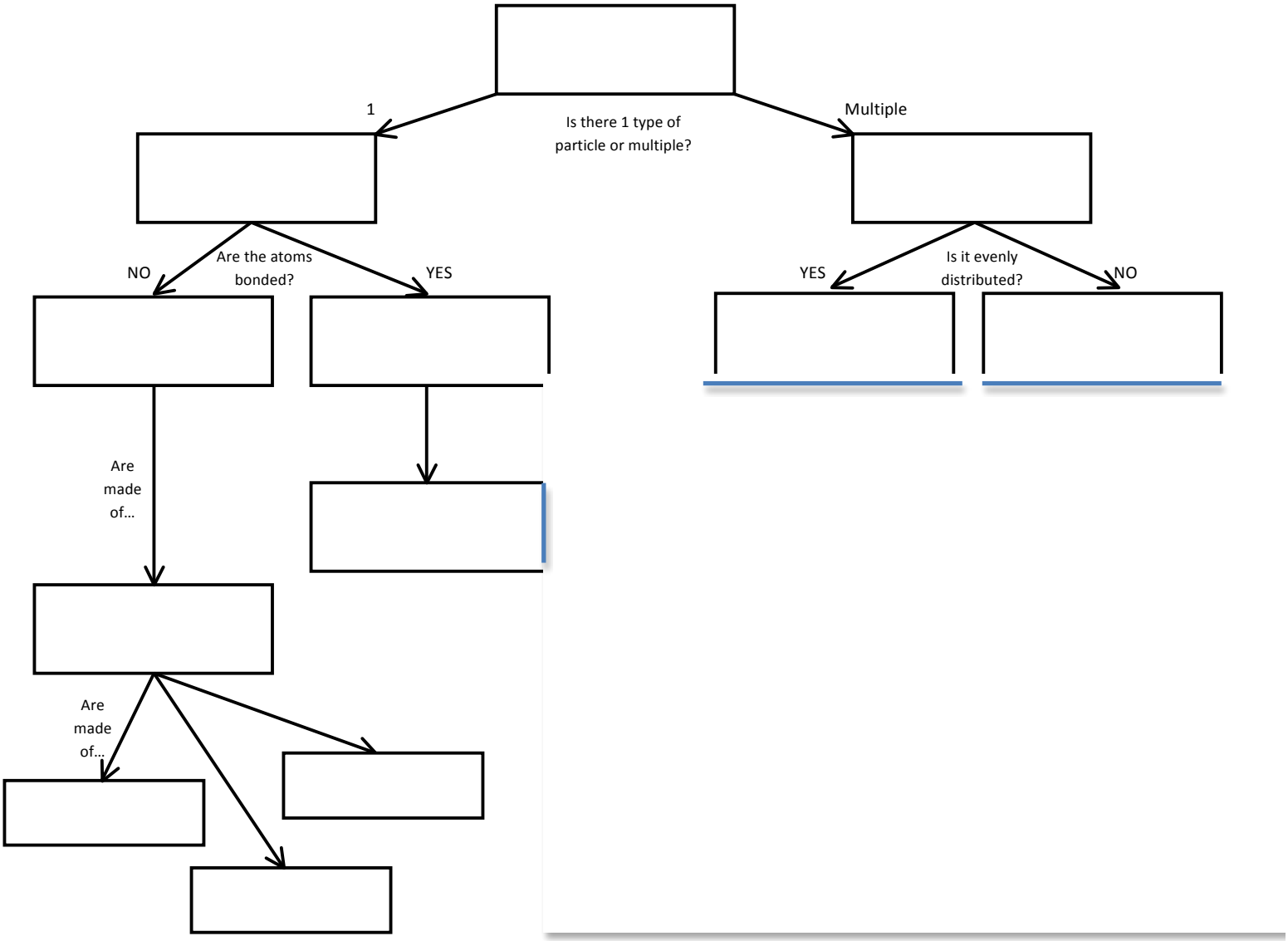
c) Mark on the graph with the letter "C" where the water is liquid and gas.

d) Mark on the graph with the letter "D" where the water is all liquid.

e) What happens to temperature during a phase change? _____

25. Look at the flow chart of matter below. Fill in the correct terms based on what you learned in class.

Next to each term you fill in, list an example of that term whenever possible



26. Big Bang

Identify and explain the 3 key pieces of evidence that support the Big Bang Theory

1.

2.

3.

27. Compare and contrast Fission and Fusion (explain, draw, end products and where it takes place)

FISSION	FUSION

If you have any questions while taking the exam, PLEASE ask your teacher for clarification. They can't give you the answer but they can help you understand what is being asked. Be sure to get a good night sleep before the exam and eat a healthy breakfast before you come in.

The Physical Science teachers would like to thank each and every one of you for all the effort and time you have put into this class. Please stop by and visit next year and let us know how you are doing in Biology (or any other science class you might be taking). NOW before you think you are done - **Go back and double check all your answers to be sure you have not made any careless mistakes. Did you show all your work and label all your answers correctly? DO NOT LEAVE ANYTHING BLANK….. ask for help!**